① If $8000 is invested at a rate of 5.5% APR compounded monthly, how long will it take the investment to reach $20,000?

$\frac{0.055}{12}$ each yr. ≈ 0.0046

$\$8000 \cdot 0.0046 \approx \$36.6$

$\$8036.6 \cdot 0.0046 \approx 36.8$

8073.4

$2 \cdot 2 \cdot 2 \cdot 2 = 2^4$

$8000\left(1+\frac{0.055}{12}\right)^x = 20{,}000$

② Write an equation for the table and find $f(32)$

X	1	2	3	4	5
Y	(2)	3	4.5	6.75	10.125

$\cdot ? \quad \cdot ? \quad \cdot ?$

$y = 2 \cdot 1.5^{(x-1)}$ exact $\quad 2 \cdot 1.5 \cdot 1.5 \cdot 1.5 \cdot 1.5$

$y = 0.39x^2 - 0.36x + 2.025$ close

$2 \cdot x = 3$

$x = \frac{3}{2}$

Exponential Equations

$y = b^x$ x is exponent

Polynomial

x^2 x is the base

$y = a\,b^x$

- a: Starting Value $x=0$
- b: growth rate (what you mult. by)

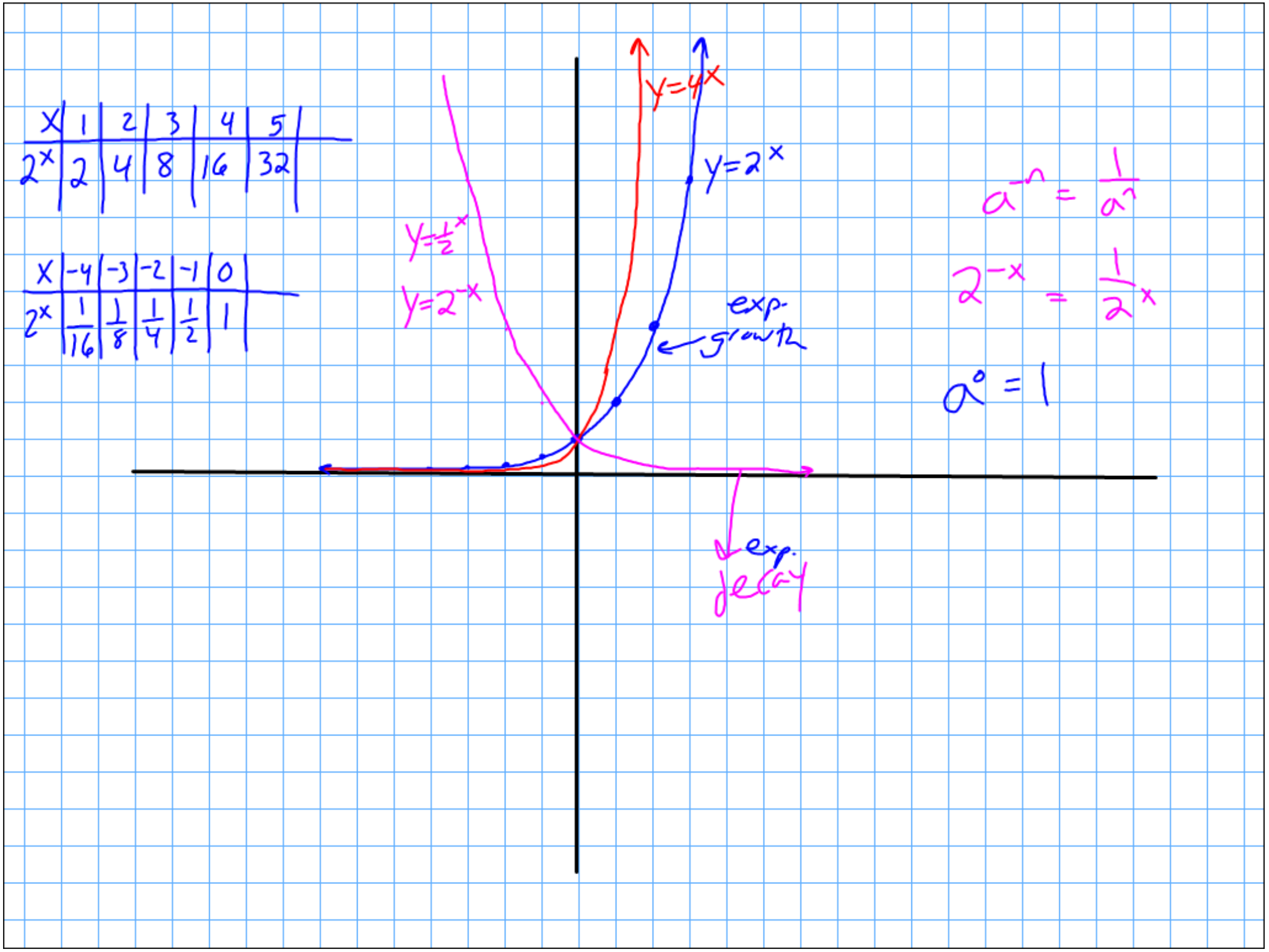
$y = \frac{4}{3} \cdot 1.5^x$

Graph

2^x , 4^x , $\left(\frac{1}{2}\right)^x$, 2^{-x}

x	1	2	3	4	5
2^x	2	4	8	16	32

x	-4	-3	-2	-1	0
2^x	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	1



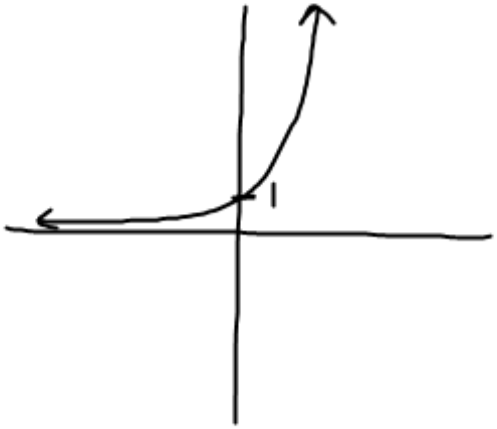
$a^{-n} = \frac{1}{a^n}$

$2^{-x} = \frac{1}{2^x}$

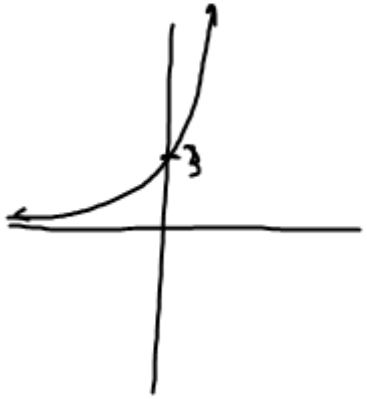
$a^0 = 1$

Without a calculator, graph

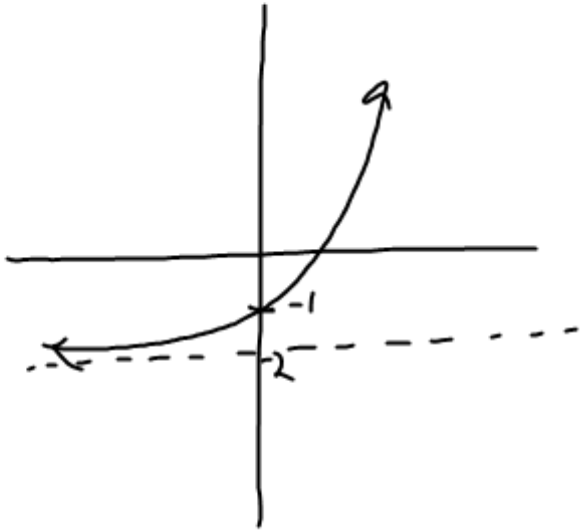
$f(x) = 3^x$



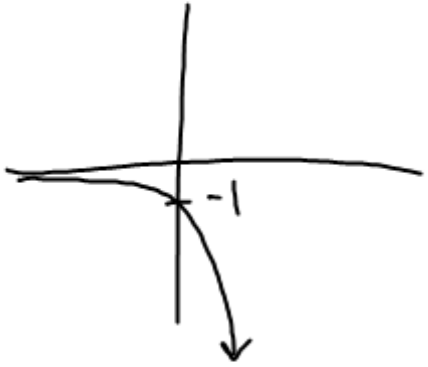
$f(x) = 3^{x+1}$ lft 1



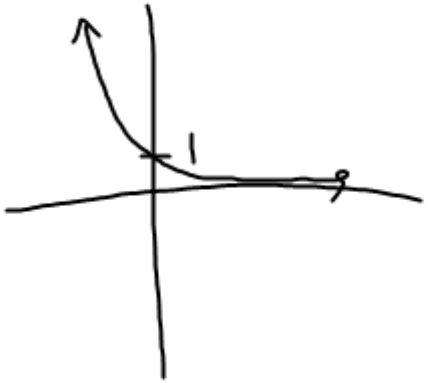
$f(x) = 3^x - 2$



$f(x) = -3^x$



$f(x) = 3^{-x}$



$y = a\,b^{x}$

- a: start value, $x = 0$
- b: growth rate (what you mult by)

Grow by a percent r, $b = (1 + r)$

$$A = P\left(1 + \frac{r}{c}\right)^{x}$$

- A: amount at time x
- P: start principle
- r: % growth (A.P.R.)
- c: compounding periods
- x: time (matches c)

$$A = 8000\left(1 + \frac{0.055}{12}\right)^{x}$$

Invest $1.00 at 100% for 1 year. How much will you have at the end of 1 year if you compound

(a) yearly? = 2.00

(b) monthly? = 2.61

(c) weekly? = 2.69

(d) Daily? = 2.71

(e) every hour? = 2.71

(f) every minute? = 2.71

$$\lim_{x \to \infty} \left(1 + \frac{1}{x}\right)^x = e$$

$$A = P\left(1 + \frac{r}{c}\right)^x$$

$$\boxed{A = Pe^{rt}}$$

approaches when grows continuously

2.718281828.....

e - natural base

Continuously Compounding

$A = Pe^{rt}$

- A: Amount at time t
- P: principle
- e
- r: rate as a decimal
- t: time in years

Invest $8000 compounded continuously for 5 years at 3.5%.

$A = 8000e^{0.035 \cdot 5}$ → 2nd Ln on calc.

$A = \$9{,}529.97$

Sect. 3.1

#1-6 (1)

#7-13 (odd)

#15-18

#23-28 (1)

#40, 47, 48

#55-58 (1)

#63-70 (2)